



**SEFSC PELAGIC OBSERVER PROGRAM DATA SUMMARY
FOR 1992-2002**

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INTRODUCTION

In 1992, the National Marine Fisheries Service (NMFS) initiated scientific sampling of the U.S. large pelagic fisheries longline fleet, as mandated by the U.S. Swordfish Fisheries Management Plan and subsequently the Atlantic Highly Migratory Species Fishery Management Plan (1998). Scientific observers were placed aboard vessels participating in the Atlantic large pelagic fishery by the Southeast Fisheries Science Center (SEFSC) and the Northeast Fisheries Science Center (NEFSC). In 1997, the SEFSC assumed sole responsibility for observer coverage of the pelagic longline fleet, however, observers associated with the NEFSC assisted with coverage of vessels in the northeast region in 1997, 1999, and 2000. Although this report will refer to the Pelagic Observer Program (POP) located at the SEFSC Miami Laboratory, the summary data presented in this report reflect the combined efforts of the SEFSC and NEFSC.

As described in previous documents (Lee et al. 1995, Lee and Brown 1998, Beerkircher et al. 2002), observer coverage by the POP since 1992 has been based on NMFS-employed observers, independent contracted personnel, and personnel supplied by observer provider companies. The POP has also been assisted by observers employed by Russell Research Associates, Inc. (RRA), which was funded through a Marine Fisheries Initiative grant (MARFIN). This MARFIN program was vital in helping the SEFSC describe the longline fishery of the Gulf of Mexico from 1993 to 1995. RRA observers, who also received training at the SEFSC Miami facility, made a major contribution in the collection of statistical and biological data from the Gulf of Mexico. These observers concentrated primarily on the Mississippi River Delta (Louisiana) ports because of their familiarity with vessel operations within that area.

The SEFSC POP trains scientific observers to record detailed information concerning gear characteristics, location and time the gear is set and retrieved, environmental conditions, status and action of the marine life caught by the gear (alive or dead, kept or discarded), as well as morphometric measurements (length and weight) and sex identification of the animal. Observers also record incidental interactions with marine mammals, sea turtles, and sea birds. Collections of biological samples (anal fin rays, heads, reproductive tissue, vertebral centrae, etc.) from some species are used to support research studies directed at critical questions about fish biology and life history.

The data collected are used by scientists in a variety of ways. Observer catch and effort data help confirm and augment the information provided through the mandatory submission of Pelagic Logbook forms by vessel owners and operators. This information is also important in evaluating the effectiveness of management measures, as well as providing information for evaluating the stock status of harvested swordfish and other marine species.

The purpose of this document is to provide a general overview of the POP and summary of data collected in the northwestern Atlantic by the SEFSC and NEFSC, 1992- 2002. The summarized data include data from the Northeast Distant (NED or "Grand Banks") experimental fishery, which was conducted during the summer and fall of 2001 and 2002.

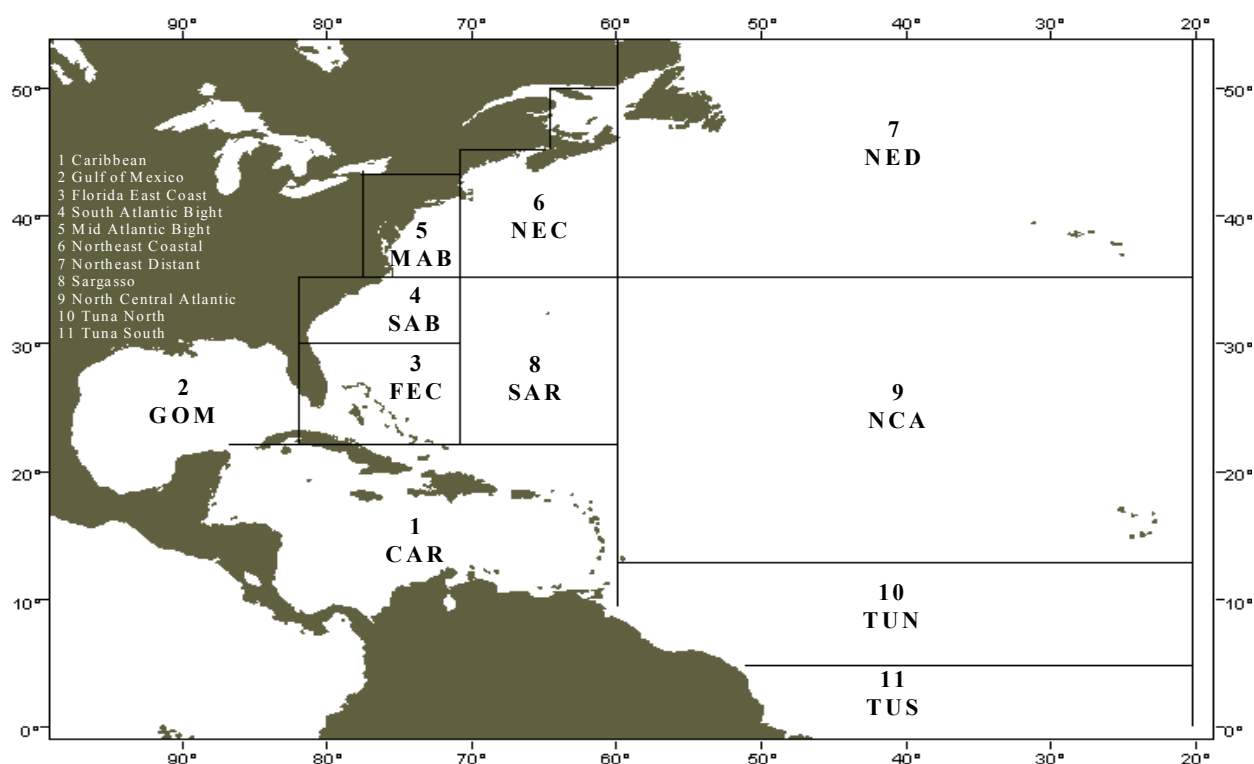


Figure 1. The fishing area definitions used in classifying the U.S. pelagic longline effort.

OBSERVER PERSONNEL

Observers receive training in sampling techniques, first aid and marine safety, as well as how to conduct themselves professionally in the field. They are also made aware that living conditions aboard ocean-going vessels can be variable (e.g. bunk accommodations, shower or toilet facilities). While an observer is aboard a vessel, the operator and crew must allow the observer time to collect statistical and biological data. However, any delay in the normal routine of processing the fish should be minimal.

VESSEL SELECTION

In order to obtain a representative, scientific sample of the fleet fishing effort, a list of randomly selected pelagic longline vessels is generated for each geographical area (Figure 1) and quarter for the current year, based upon reports of their effort (number of sets) from the Pelagic Logbook forms and landing records from the previous year.

The objective of the selection during 1992-2001 was to achieve a representative, 5% cross section of the fishing effort in each fishing area and during each calendar quarter of the year (a 5% sampling fraction roughly corresponds to 600 sets observed per year). The chance of selecting an individual vessel depends on fishing effort that particular vessel reported by area and quarter in the previous year.

Due to the need of a 5% coverage for each quarter and area that the fleet fishes, an individual vessel could be selected for observation as many as four times in a year. Beginning in 2002, the observer coverage rate was increased to 8 %, thus slightly increasing the probability of an individual vessel being selected in **multiple and/or consecutive quarters during any given year.**

Observer coverage on a vessel becomes mandatory under U.S. fishery regulations when vessel owners and operators, permitted for the fishery, are selected and notified in writing. A letter of selection signed by the SEFSC Center Director is mailed to the selected fishery permit holder.

SELECTION LETTER

The SEFSC selection letter states that the POP coordinator must be notified by the vessel owners/operators, in writing, of **each fishing trip** using pelagic longline gear during the time period stated in the letter. It also specifies the minimum number of sets required by the POP in order for that vessel to fulfill its obligation for observer coverage. Planning and coordination of observer coverage prior to each trip departure is very important. For convenience, each selection letter is mailed with a trip notification form that, when returned prior to a trip, provides the POP coordinator with written information concerning the vessel's name, captain, contact persons and phone numbers, communications and safety equipment available aboard the vessel, and information about the vessel's location, dates, and times of departure and return. The form can also be used to inform the POP coordinator when a vessel is active in another fishery, under repair, or no longer fishing. The written notification is necessary to document owner or operator efforts to comply with mandatory coverage. Telephone calls are helpful, after written notification, to determine other specific details prior to the deployment of the observer to meet the vessel. It is important to keep in mind that observer coverage by the SEFSC is based on a minimum number of sets per selected vessel (specified in the selection letter) and additional coverage may be required if the trip is shorter than expected.

SAFETY EXAMINATION DECAL

The Observer Health and Safety Regulations (50 CFR 600) became effective in June 1998 and require vessels that are subject to mandatory observer coverage to display a current Commercial Fishing Vessel Safety Examination decal. Two formal NMFS notices of the requirement have been distributed to permit holders, the latest distribution occurring in December 2001. Dockside examinations are free and the decal is valid for two years. Vessels owners or operators who need to have their vessels examined in order to comply with the regulations should contact the local U.S. Coast Guard or the observer office for the phone number of the closest Marine Safety Office Dockside Examiner.

VESSEL NON-COMPLIANCE

The Atlantic Highly Migratory Species Fisheries Management Plan (50 CFR 635) specifies that once notified in writing, the owner and/or the operator must keep the SEFSC informed of their fishing activities and trip departures during the period of selection. Vessel owners/operators must also understand an observer assigned to monitor a fishing trip can be a **male or female** due to federal regulations prohibiting discrimination in hiring and/or contracting practices. In general, the lack of bathroom facilities, privacy, or sparse living conditions aboard a vessel is not sufficient grounds to prohibit observer coverage by either a male or a female observer. Once arrangements have been made by the SEFSC office to assign an observer to a vessel, the vessel operator must wait until the observer has arrived. Advance notification of departure times and locations can prevent any unnecessary delays. If the vessel departs once observer coverage has been arranged or if the operator rejects an observer present for boarding, this will be documented and the vessel name submitted for non-compliance to the NMFS Southeast Regional Office (SERO) which is responsible for issuing annual permits for participation in the fishery and to the NMFS Enforcement Office responsible for enforcing federal fisheries regulations. Permit holders, owners, and/or operators of vessels can also be reported to SERO for observer non-compliance for non-communication with the coordinator's office (Lack of verbal or written notification of departures or fishing activities), hindrance of the observer in completing his/her data collection duties, and/or harassment during the observed trip. Lastly, a permit holder's failure to display a current Commercial Fishing Vessel Safety decal during the selection period or when an observer arrives at the vessel for deployment will also be reported to SERO. Submission of a vessel owner or operator's name for observer non-compliance is not taken lightly and is only initiated when the circumstances leave no alternative. However, once submission occurs, the observer program personnel do not control actions taken by SERO and NMFS Enforcement office. It is the intent of this program to seek a good working relationship between the scientific personnel involved in the data collection and the daily routine of the vessel crew.

DATA COLLECTION FORMS

In order to record data needed to describe the catch and effort of the longline fishery, the POP observer must complete three data forms (Appendix 1). The first is called the "Longline Gear Characteristic Log", which is used to record the type of mainline used, length of drop line, number and length of gangions, make and model of hooks used, as well as the number of floats, high fliers, and radio beacons used. The second data form is the "Longline Haul Log", which is used to describe fishing effort. This form allows the observer to record the length, location and time duration for each set and haulback, as well as environmental information, the speed at which the vessel sets the gear, and type of bait used. The last of the data forms is called the "Large Pelagic Individual Animal Log". This data sheet allows the observer to record the species of fish caught, condition of the catch (alive, dead, damaged, or unknown) when brought to the vessel, and the final disposition of the catch (kept, thrown-back, finned, etc.). When an animal is brought onboard the vessel, the observer will verify species identification and record length measurements. A final weight of the carcass is recorded during unloading at the dock. This weight is matched to the length measurements on the data sheets using a specially numbered tag to identify the carcass of primary interest.

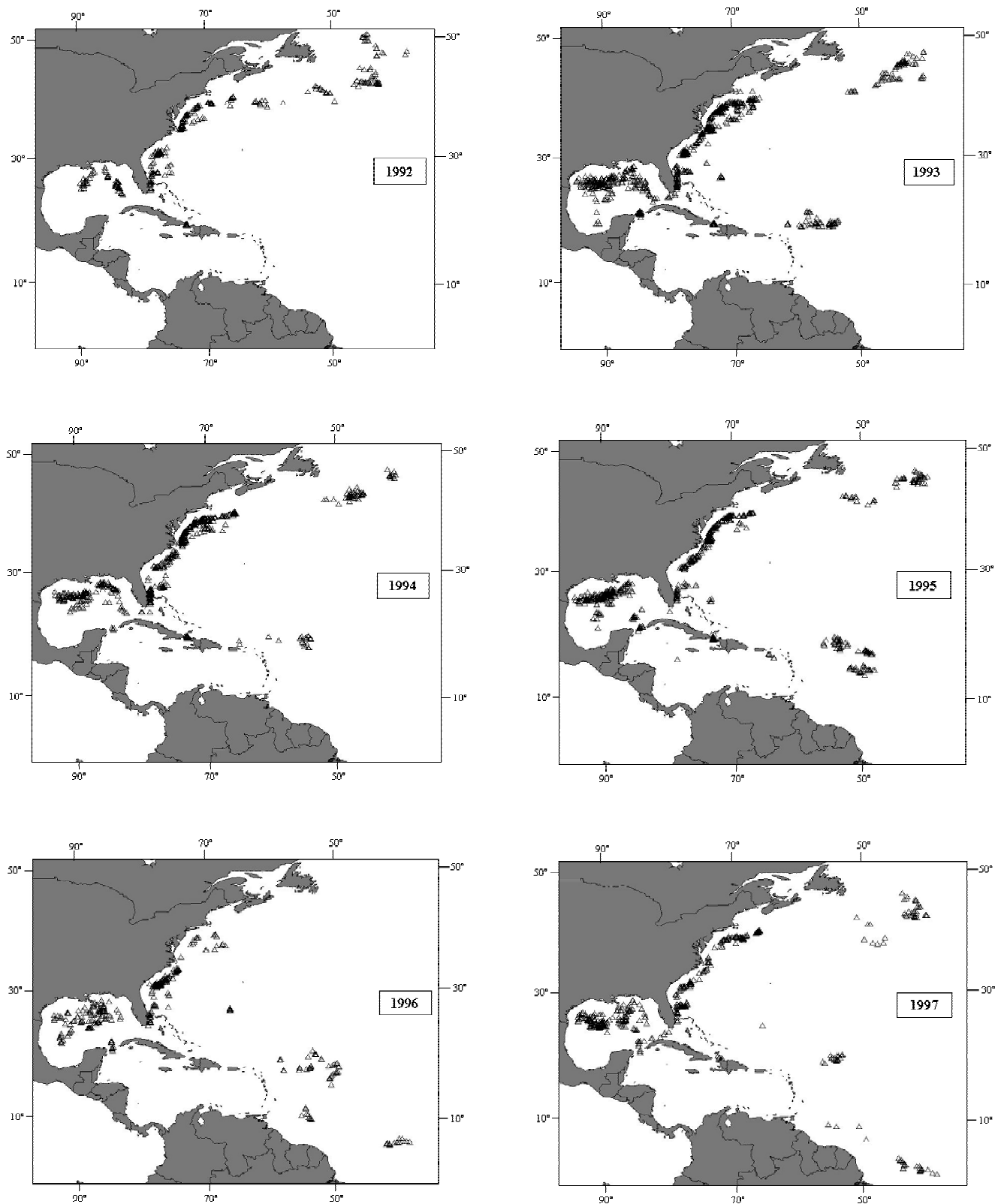


Figure 2. Locations of pelagic longline hauls observed by SEFSC and NEFSC observers, 1992-2002

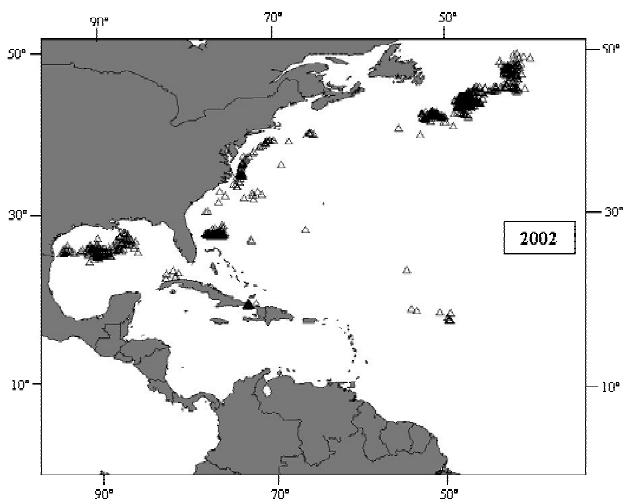
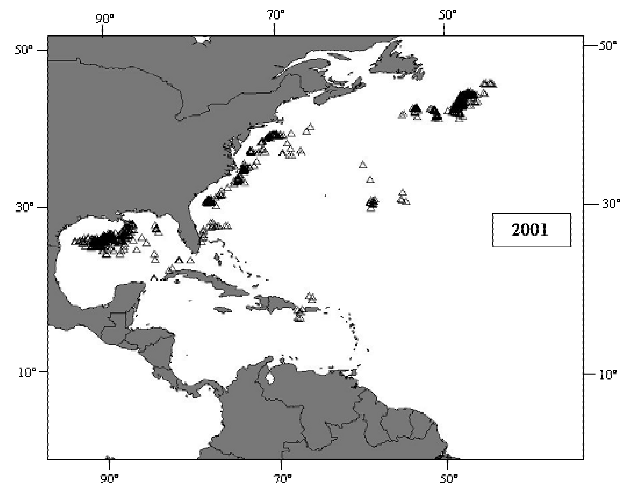
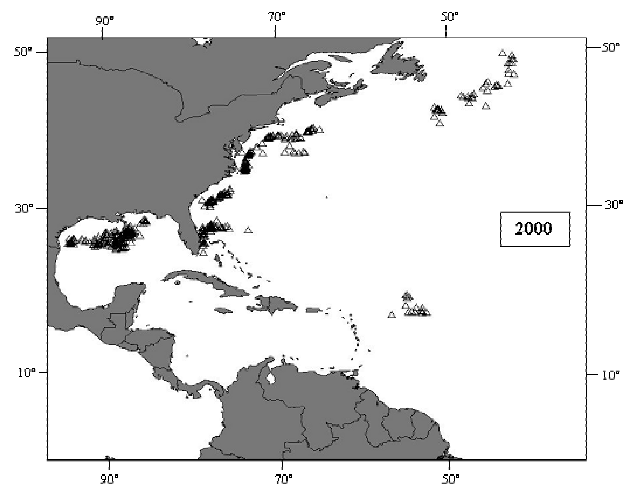
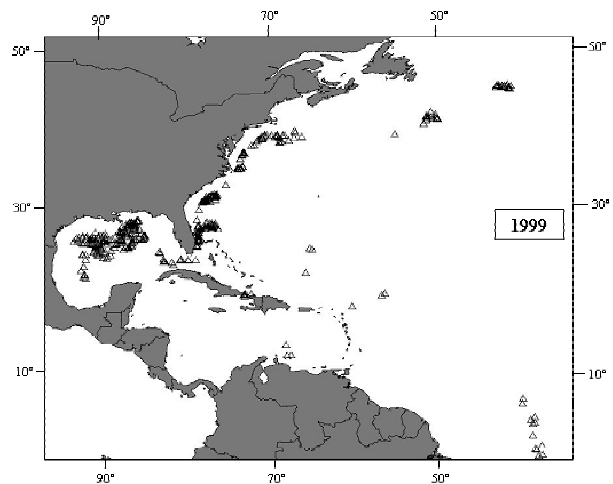
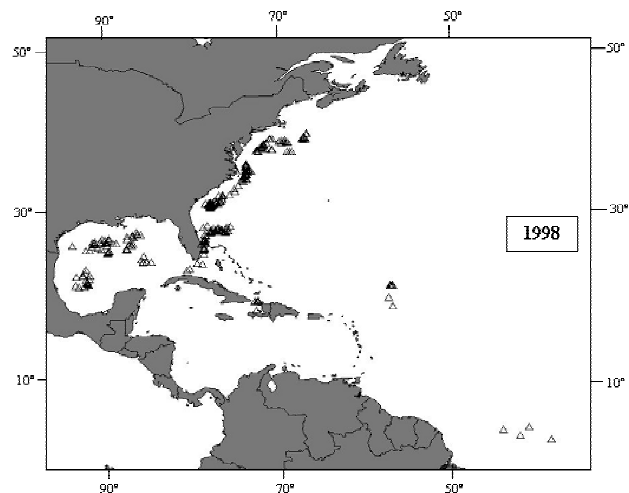


Figure 2. (Continued)

DATA SUMMARY

1992 - 2002

Vessel Coverage

From May 1992 through December 2002, scientific observers associated with the SEFSC and NEFSC observed a total of 794 pelagic longline trips in waters of the northwest Atlantic Ocean (Table 1). In total, observers spent 10,613 days-at-sea during which 5,895 sets and 6,137 hauls were observed (Figure 2 and Table 1). POP procedure is to count any haul that is interrupted intentionally to allow the gear to soak longer, or that is interrupted for weather or mechanical problems for longer than 6 hours, as a “split haul” (i.e. a single set that has two or more hauls associated with it). Further, during the 2001 NED experimental fishery each set was divided into 2 hauls. This accounts for the discrepancy between numbers of sets and numbers of hauls.

Of the trips monitored, a total of 206 vessels were observed at least once during this time period. Data from 4 trips were excluded from analysis in this report because the gear was set as bottom longline and directed at shark species.

Based on the POP experience, scheduling fishing and fishing trips are not always predictable. Excluding the difficulties of communication with owners or operators concerning fishing trip departures, scheduling of an observed trip on any selected vessel can also be hindered by mechanical repairs, weather, crew or captain replacement, activity in another fishery, as well as availability of an observer for an observed fishing trip. Given all of the variables that can affect scheduling an observed trip, the POP from 1992 to 2002 was successful in achieving an overall average of 86% of the target number of sets.

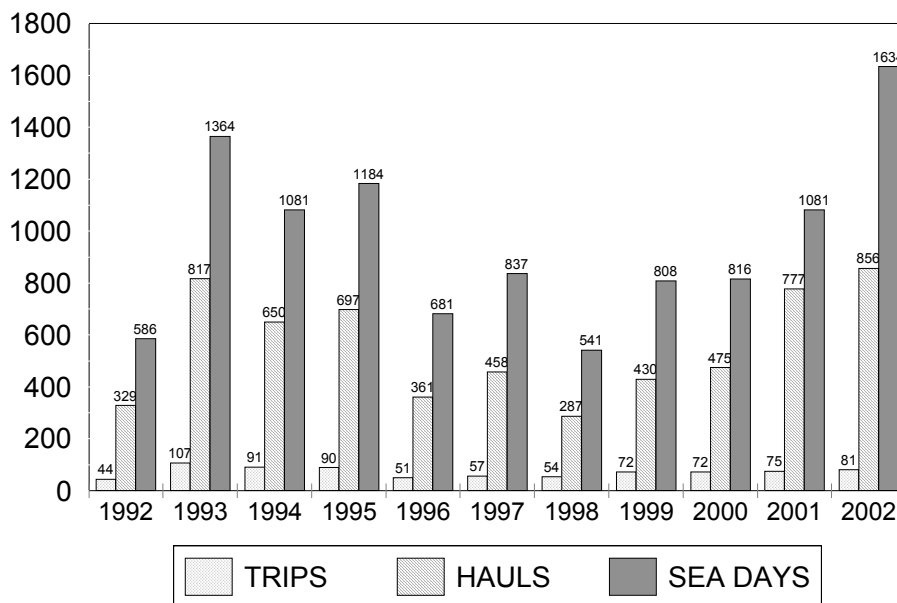


Figure 3. POP observer effort, 1992 - 2002.

Given the transit time to and from the fishing grounds and the effort (in days) spent fishing, a POP observer spent an average of 1.8 days at sea for each set observed (Figure 3, Table 1).

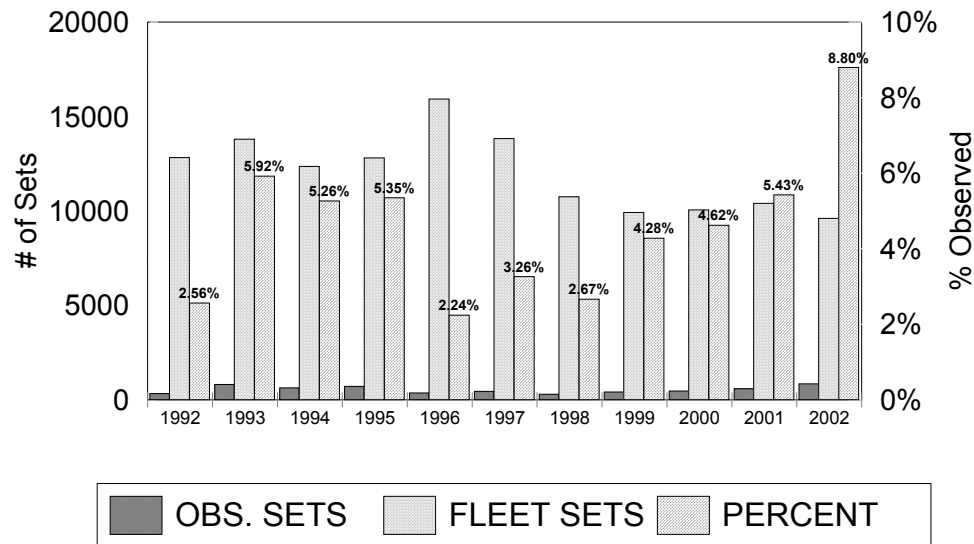


Figure 4. Comparison of total observed sets recorded by the POP, the sets reported by the U.S. pelagic longline fleet through pelagic logbook forms, and percent coverage achieved by year, 1992 - 2002.

The overall average percent coverage was over 4 percent for all years combined (Figure 4). The years in Figure 4 when the percent coverage was over 5 percent (1993-1995), both regional observer programs were operating at funding levels of about \$1.2 million per year. The variation in the percent coverage during 1996-2002 reflects variable funding and fleet participation.

NED Experimental fishery

During 2001 and 2002, NMFS, in partnership with numerous longline vessels, conducted experimental gear research in the northeast distant closed area (the Grand Banks). The research was designed to find ways of reducing bycatch of marine turtles, as well as developing safe handling methods for turtles that interacted with the fishing gear. During the summer and fall of 2001, 8 vessels made 186 sets, and during the summer and fall of 2002 14 vessels made 503 sets. The concluding season of research was conducted in 2003; see <http://www.mslabs.noaa.gov/mslabs/docs/watson4.pdf> for information on experimental design and project results.

In the interest of simplicity, combined data from both the experimental fishery and the regular fishery are presented in this summary. However, because the experiment fishery had 100% observer coverage, a relatively large portion of the total observed effort (11.7% of the sets and 14.7% of the hooks) reported in this data summary is derived from experimental effort in the NED.

Species Observed

The presence of a scientific observer onboard a commercial longline vessel provides an opportunity for collecting valuable information for monitoring both the fishery and the stocks being harvested. The data forms provide scientists with basic information concerning gear configuration, baits used, number of hooks set, and the environmental parameters associated with a particular set. Equally important, the observers record data concerning the species of fish encountered, their size, sex and status (kept, discarded, etc).

Data collected during a fishing trip are entered into a computer usually within 7 days upon the observer's return to port. Data are screened for accuracy during the debriefing meeting with the observer followed by data entry. Audit programs are used by the POP that help to catch data entry errors. Because of the ongoing refinement of the quality assurance programs, the accuracy of the observer database is increasingly improved.

Summarizing the 1992-2002 catch data, observer personnel identified a total of 215,807 fish, marine mammals, sea turtles and birds (Figure 5; Tables 2 and 3).

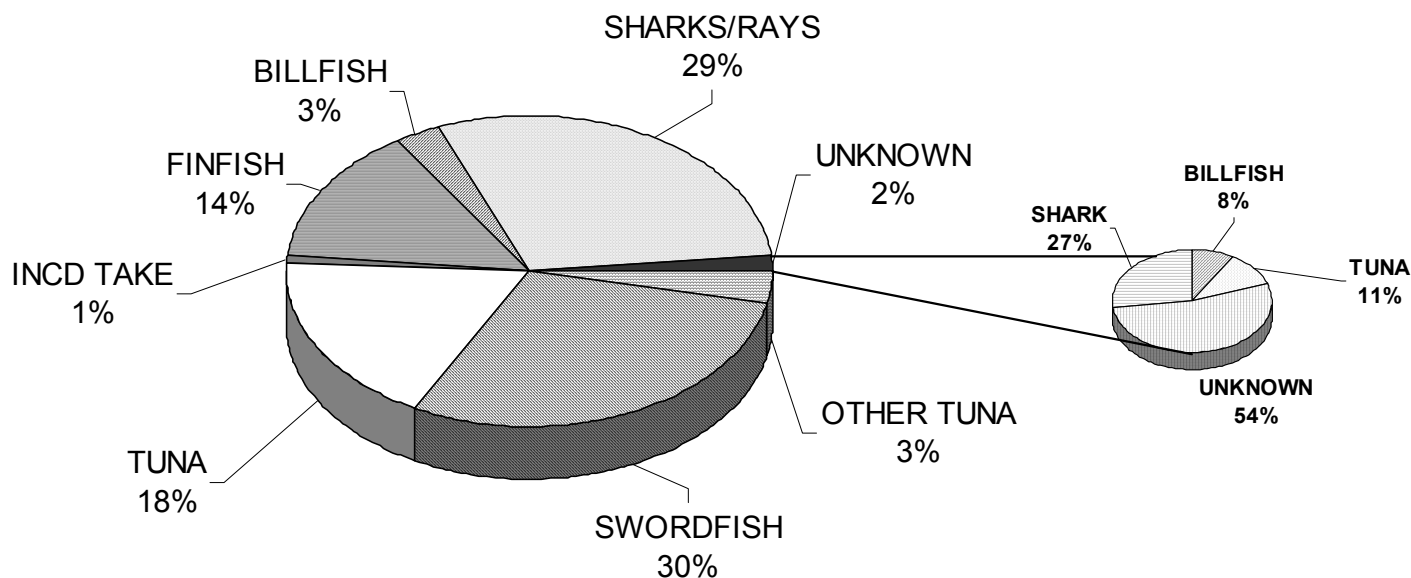


Figure 5. Species composition of the 215,807 animals observed by general category groups (except cephalopods) by the POP, 1992-2002. The incidental take (marine mammals, turtles, and sea birds) represents less than 1% of the total catch documented in the POP database. The tuna category is comprised of yellowfin, bigeye and bluefin.

This total includes 3,596 fish in the “UNKNOWN” category that could only be identified to a general fish category, (i.e. unknown tuna, unknown shark, etc) but the observer was able to determine the alive/dead status. In addition, the Incidental Take (INCD TAKE) (Figure 5; Table 3) includes 158

marine mammals (6% released dead), 1,347 sea turtles (<1% released dead), and 114 seabirds (68% released dead). The overall total excludes 19 squid, which were not included in Figure 5.

Although a wide variety of fish were caught by the observed longline vessels, only about six species were routinely valued by the fishery as a marketable product. These primary species (swordfish, yellowfin tuna, bigeye tuna, bluefin tuna, mahi-mahi, and shortfin mako) comprise about 56% by number (N=120,295) of the total observed catch. Of the total observed fish (Figure 5), swordfish made up 30% by number of the catch; while yellowfin, bigeye, and bluefin tunas, combined, made up 18% by number of the observed catch. Sharks and rays, a bycatch of the tuna and swordfish fishery, made up the other major portion of the pelagic longline catch, about 29% by number.

Observation of the status (alive/dead) of fish caught is an important component needed for assessing the effectiveness of some fishery management tools, like minimum sizes. The observer records the status (alive, dead, damaged) of the fish as it is brought alongside the vessel (Tables 2 and 3) and whether it is kept or thrown back. From these data, mortality of discards can be estimated (Table 4). In general, these proportions are similar to the alive/dead proportions for various Atlantic pelagic species caught on longline reported in the literature (Farber and Lee 1991; Hoey 1992; Lee et al. 1995).

Gear Characteristics

Observer coverage took place in all of the 11 geographical areas shown in Figure 1. As an overview of the observed longline gear deployed, the shortest average length of mainline set on an observed trip was 4.4 nautical miles (NM) while the longest average set during a trip was 46.6 NM. Additionally, during the 6,137 hauls observed, a total of 4,138,830 hooks were recorded (Table 1).

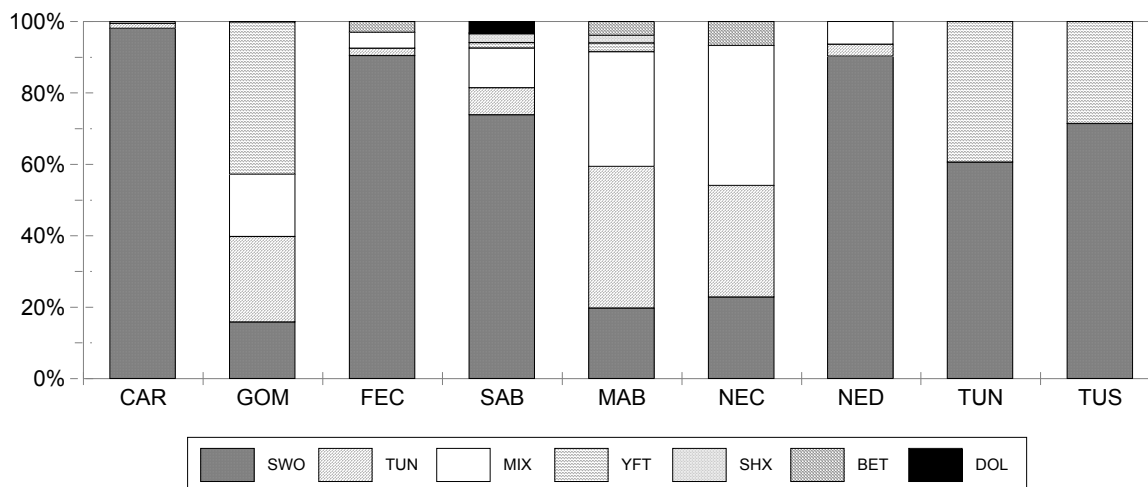


Figure 6. Indicated target species for hauls observed, by area (see Fig. 1). SWO=swordfish, TUN=mixed tunas, MIX=any combination (usually a combination of swordfish and a tuna species), YFT=yellowfin, SHX=sharks, BET=bigeye tuna, and DOL=mahi-mahi. The SAR and NCA areas are not shown because SWO was the target species in 100% of the hauls observed in those areas.

Indicated target species for hauls was highly variable among different areas; however, swordfish was the indicated target species for over 80% of the hauls observed in the CAR, FEC, NED, SAR, and NCA (Fig 6). Tuna or a mixture of tuna and swordfish made up the majority of indicated target species in sets observed in the GOM, MAB, and NEC. The target species information given here should not be used to characterize the entire fleet's effort. For example, it had been the policy of the POP to only place observers on vessels that were using pelagic longline gear to target swordfish or tunas and vessel owners or operators who reported they were using pelagic longline gear to target sharks or mahi-mahi were generally waived from coverage. For this reason the proportional fleet effort by pelagic longliners directed at species other than swordfish or tunas is probably higher than indicated here. The shark or mahi-mahi directed sets that were observed by POP personnel were generally the result of a captain deciding to switch target species from swordfish or tuna during the trip. Note that current POP policy is to observe any pelagic longline set, regardless of target species.

Variation in gear construction influencing hook fishing depth (i.e. length of float line plus length of gangion) is quite variable among vessel operators. It should be understood that actual fishing depth of the baited hook is unknown due to influences by ocean currents and environmental conditions. However, given an assumed fishing depth based on float line and gangion length, three general groupings can be found depending on the geographic areas where fishing takes place.

The average minimum and maximum depths of the baited hooks are similar for the MAB, NEC, and NED (Table 5), with a range from 9 to 19 fathoms (17-35 m) for the three geographical areas. This represents the shallowest of the three general fishing depth groupings observed. Generally speaking, observed vessels fishing in the waters of the MAB and NEC target more on tuna species while the NED is typically directed more at swordfish (Fig. 6). The second grouping includes the GOM, FEC, SAB, and TUS, with a range of 18 to 36 fathoms (33-66 m). Vessels observed fishing in the waters off the southeast U.S. (FEC and SAB) and down below 5 degrees of North latitude (TUS) target mostly swordfish, with yellowfin generally found as a by-catch, whereas observed vessels in the GOM primarily target yellowfin tuna with a by-catch of swordfish. The deepest fishing depth grouping includes the CAR, SAR, NCA, and TUN with a range of 31 to 42 fathoms (57-77 m). Observed effort in these areas was almost completely directed at swordfish. These data suggest that fishing depths depends more on the area fished rather than target species. For example, observed hook fishing depth was shallowest in the NED and deepest in the CAR but in both areas the target species was swordfish.

Observers also recorded various kinds of bait (species) used during fishing activities. Generally speaking, the technique of fishing "dead bait" (bait brought aboard the vessel frozen and then thawed prior to use) is the prevalent bait method used in all geographical areas (Table 5). On any given set, most crews fish a single species of bait. The primary "dead bait" species recorded for observed sets were Atlantic mackerel (*Scomber scombrus*) and squid (*Illex* spp). Other frozen baits recorded on some of the trips observed, were from the Clupeidae (herring and shad) or Carangidae (scad) families. Although the technique of placing "dead bait" on hooks is used in the Gulf of Mexico, another baiting technique commonly observed on the Asian-American vessels in that region between 1992 and 2000 was the use of "live bait". These "live bait" species, caught at sea near oil platforms, were kept alive onboard the

vessels in holding tanks. The vessel crews were opportunistic as to the bait utilized and were concerned more with availability and quantity of bait than a preference for a particular bait. Therefore, this technique could use multiple species for a given set or fishing trip. The predominant “live bait” species utilized by the Asian-American fleet included bigeye scad (*Selar crumenophthalmus*), chub mackerel (*Scomber japonicus*), and Spanish sardines (*Sardinella aurita*).

As previously reported in Lee et al. (1995), squid and mackerel continue to be the preferred bait kind (84% of hauls observed) associated with the “dead bait” technique observed in the longline fishery for all areas (Table 5), with squid being the most common bait in all geographical areas. In the GOM area where both baiting techniques occurred, only 20% of the hauls observed used the “live bait” technique. The “live bait” technique was used generally by Asian-American fishers targeting primarily yellowfin tuna. Regulations that became effective September 1, 2000, prohibited the use of live bait on pelagic longlines in the Gulf of Mexico in order to reduce bycatch.

RECENT POP RESEARCH STUDIES UNDERWAY

Numerous analyses of the POP data are conducted in support of determining the status of fishery resources. However, POP observers also aid in the collection of biological samples. Below are summarized a few POP research studies underway or recently completed making use of the specimen materials collected through the POP.

Swordfish Reproduction

The SEFSC Pelagic Observer Program has supported a swordfish reproductive study under the direction of Dr. Freddy Arocha of the Instituto Oceanográfico de Venezuela, Universidad de Oriente in Venezuela. Between April 1990 and June 1995, 2884 gonad samples were collected for this study from swordfish caught by longline through the cooperation of various captains and crews, POP personnel, and personnel from the Fondo Nacional de Investigaciones Agropecuarias (FONAIAP) in Venezuela. Some of the results from the study follow (see Arocha 2002 for further information):

- 1) Female swordfish in the northwestern Atlantic are multiple spawners and have asynchronous oocyte development.
- 2) Six stages of gonadal development were developed that should allow observers to categorize female swordfish in regards to reproductive state. This could be an important data gathering tool in the future in refining swordfish stock assessments.

Swordfish Age and Growth

Dr. Freddy Arocha is also working with the SEFSC in the analysis of anal fin spines collected from swordfish in the northwestern Atlantic Ocean. From 1996 to 1999, the POP collected 2,037 fin spines (900 male and 1,137 female). Dr. Arocha analyzed these samples (as well as samples provided by the

Venezuelan longline observer program) in order to update age and growth models for swordfish. Male, female, and unisex growth curves were produced for use in upcoming swordfish stock assessments (see Arocha et al. 2003 for further information).

Shark Age and Growth

In 1999 the POP began collecting vertebral centra from sharks; during 2001-2002 67 centra (primarily from silky, blue, and shortfin mako sharks) were sent to Dr. John Carlson of the SEFSC Panama City laboratory. Information from these centra and other collection efforts will be used by Dr. Carlson to develop or update age and growth models for future shark population assessments.

Tag Release and Recapture

The Cooperative Tagging Center (CTC) is located at the Miami Laboratory, Miami, FL. The purpose of the CTC is to provide tags to those wishing to participate in the tag release program, and to collect, archive, and analyze data collected from returned specimens. In order to study movements, as well as gain insight into growth rate, longevity, and mortality rates of highly migratory species, the CTC needs the assistance of individuals and organizations that are willing to tag on a voluntary basis. Mr. Dennis Lee is the CTC contact for the commercial fishing community. For the purpose of providing a large number of tags (not to exceed 50 tags per request) to the commercial fishing community, fishermen are asked to contact Mr. Lee. For persons tagging for the first time, a form will be provided which will need to be completed and mailed to the Miami Laboratory. Once the form has been received, a minimum of 25 tags will be provided the first time. If a tagger is already in the CTC database, up to 50 tags may be issued at one time. Keep in mind, however, that the Miami Laboratory reserves the right to limit tag quantity provided.

The Apex Predator Program is located at the Narragansett Laboratory, Narragansett, Rhode Island. This program is similar to the CTC but the focus is on sharks. For more information on shark tagging, contact Lisa Natanson at 401-782-3320.

As mentioned, tag recaptured fish are extremely important in providing information needed for studies of age, growth, migration and mortality rates of fish populations. Because the observer or the captain and crew do not have ready access to tag release data, all dead fish with a tag should be considered extremely important. Examples of the types of information obtained from recaptured fish follow:

- 1) A tag-recaptured swordfish was caught in October 2001 by a longline vessel while a POP observer was aboard. From the tag recapture number (#R310189), it was determined that the swordfish had been at large for over 8 years. The fish had been tagged in the south Atlantic Bight and was recaptured off the Grand banks.
- 2) A longline vessel recaptured a swordfish in 2001 that had been at-large for 24 months. It had been tagged off Georges Bank and recaptured off Charleston, South Carolina.

3) A tagged swordfish was recaptured in the summer of 2002 off the Grand Banks. A longline captain originally tagged the fish 5 years earlier off the Florida east coast.

4) A longliner with a POP observer on board recaptured a blue shark in 1997 (tag #M237544) that had been at large for over 3 years. The shark had been tagged just off Montauk, and recaptured in the mid Atlantic Bight.

The above are a few of the interesting tag recaptures that took place with a POP observer on board the vessel. It is important for everyone to understand that the recapture of a tagged fish can be a treasure chest of information and lend much insight into the life history biology of a fish. In some cases, it can extend what we know about a fish's longevity. We appreciate all those that do participate and are willing to assist anyone who wants to get started.

ACKNOWLEDGMENTS

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LITERATURE CITED

- Arocha, F. 2002. Oocyte development and maturity classification of swordfish from the north-western Atlantic. *Journal of Fish Biology* 60:13-27.
- Arocha, F., C. Moreno, L. Beerkircher, D.W. Lee, and L. Marcano. 2003. Update on growth estimates for swordfish, *Xiphias gladius*, in the northwestern Atlantic. *International Commission for the Conservation of Atlantic Tunas, Collective Volume of Scientific Papers* 55:1416-1429.
- Beerkircher, L.R., C.J. Brown, and D.W. Lee. 2002. SEFSC Pelagic Observer Program Data Summary for 1992-2000. NOAA Technical Memorandum NMFS-SEFSC 486. 26 p.
- Farber, M. I. and D. W. Lee. 1991. A statistical procedure for estimating the mortality on discarded billfish caught by longline gear. *International Commission for the Conservation of Atlantic Tunas, Collective Volume of Scientific Papers* 35:113-119.
- Hoey, J.J. 1992. By catch in U.S. Atlantic longline fisheries for swordfish and tuna. *Blue Water Fishermen's Association Newsletter*, March 16, 1992. 7p.
- Lee, D.W., C.J. Brown, and T.L. Jordan. 1995. SEFSC pelagic longline observer program data summary for 1992-1994. NOAA Technical Memorandum NMFS-SEFSC-373. 19p.
- Lee, D.W., and C.J. Brown. 1998. SEFSC pelagic observer program data summary for 1992-1996. NOAA Technical Memorandum NMFS-SEFSC-408. 21p.

For more information

Information on the observer program or for scheduling an observer trip, please contact the Pelagic Observer Program Coordinator, Dennis Lee:

(Office) 800 858-0624 (FAX) 305 361-4562

Address: Southeast Fisheries Science Center
Miami Laboratory
75 Virginia Beach Drive
Miami, FL 33149

General information or questions about programs concerning HMS dealer reporting, HMS logbook submission, or the tagging program, persons should contact the following NMFS contact persons:

DEALER REPORTING: Andy Bertolino 305-361-4240
PELAGIC LOGBOOK REPORTING: Andy Bertolino 305-361-4240
GAMEFISH TAGGING PROGRAM (CTC): Dr. Eric Prince 800 473-3936
Fish tagging liaison (commercial fisheries): Dennis Lee 305 361-4247
APEX predators program (shark tagging): Lisa Natanson 401-782-3320

Information on fishing permits or regulation should be directed to the NMFS Southeast Regional Office, St. Petersburg, FL. or Northeast Regional Office Gloucester, MA.

REGULATIONS AND PERMITS BRANCH: (727) 570-5326

National Marine Fisheries Service
Southeast Regional Office
9721 Executive Center Drive, N
St. Petersburg, FL 33702

TUNA PERMITS: 1-888-872-8862 (automated)

National Marine Fisheries Service
Northeast Regional Office
1 Blackburn Drive
Gloucester, MA 01930

Highly Migratory Species (HMS) regulatory information can also be found on the internet at:

<http://www.nmfs.noaa.gov/sfa/hmspg.html>

Table 1. Number of vessels covered, trips, sets observed, days spent at sea, total hooks set, and percent of sets observed from the total sets required for 5% coverage (8% in 2002) of the fishing effort, 1992-2002.

POP OBSERVER COVERAGE 1992-2002						
YEAR	VESSELS OBSERVED	TRIPS	SETS OBSERVED	DAYS AT SEA	TOTAL HOOKS SET	% of SETS TARGETED ¹
1992	42	44	329	586	197,869	51%
1993	82	107	817	1364	534,969	>100%
1994	75	91	650	1,081	421,487	>100%
1995	74	90	686	1,184	484,944	>100%
1996	47	51	356	681	223,387	45%
1997	53	57	451	837	318,580	65%
1998	49	54	287	541	180,962	53%
1999	55	72	424	808	291,553	86%
2000	62	72	465	816	322,756	92%
2001	57	75	584	1081	455,136	>100%
2002	45	81	846	1634	707,187	>100%
OVERALL	206 ²	794	5,895	10,613	4,138,830	N/A
YEARLY MEAN:	60	72	536	965	376,257	86%

¹ % of Sets Targeted = (Sets Observed/Sets Targeted) x 100

² Overall Vessels Observed includes no duplications among years. Yearly totals of Vessels Observed include no duplications within that year.

Table 2. Numbers of alive, dead, and damaged (shark bitten, etc) swordfish, billfish, tunas, and sharks when brought alongside the boat as recorded by POP observers while deployed aboard U.S. commercial longline vessels, 1992-2002. Does not include animals whose status was unknown (<1% of all animals observed).

GROUP	COMMON NAME	ALIVE	DEAD	DAMAGED
SWORDFISH	SWORDFISH	14,401	46,638	2,271
TUNA	BIGEYE TUNA	5,976	4,788	803
	YELLOWFIN TUNA	13,333	11,137	2,034
	BLUEFIN TUNA	418	697	58
BILLFISH	ATLANTIC SAILFISH	680	1,047	50
	BLUE MARLIN	956	526	33
	SPEARFISH SPP.	95	86	2
	SPEARFISH ROUNDSCALE	4	39	1
	SPEARFISH LONGNOSE	61	120	2
	WHITE MARLIN	1,288	1,137	48
SHARKS/RAYS				
Small Coastal	ATLANTIC SHARPNOSE	78	112	13
Large Coastal	BLACKTIP	37	74	0
	BULL	27	12	0
	HAMMERHEAD SPP.	275	208	3
	HAMMERHEAD SMOOTH	2	4	0
	HAMMERHEAD SCALLOPED	246	360	11
	HAMMERHEAD GREAT	33	54	1
	LEMON	1	0	0
	NURSE	1	0	0
	SANDBAR	560	115	1
	SILKY	1,162	1,822	23
	SPINNER	13	8	1
	TIGER	678	21	0
Pelagic	BLUE	34,414	7,659	119
	THRESHER COMMON	68	29	0
	MAKO SPP.	388	157	0
	MAKO SHORTFIN	1,611	676	20
	WHITETIP OCEANIC	286	121	0
	PORBEAGLE	219	109	2
	THRESHER	61	22	0

Prohibited	BASKING	1	0	0
	BIGNOSE	14	26	2
	DUSKY	1,085	724	14
	NIGHT	181	658	16
	MAKO LONGFIN	65	61	1
	REEF	5	2	0
	SAND TIGER	3	1	0
	THRESHER BIGEYE	292	187	2
Others	CROCODILE	115	45	2
	DOGFISH SMOOTH	53	4	1
	DOGFISH SPINEY	89	1	2
	VELVET DOGFISH	0	2	0
	DOGFISH	35	0	0
	COLLARED DOGFISH	1	1	0
	GREENLAND	2	0	0
	LITTLE GULPER	1	0	0
	SHARPNOSE SEVENGILL	1	1	0
	SKATES/RAYS	7,298	67	5

Table 3. Numbers of alive, dead, and damaged (shark bitten etc.) other tunas, finfish, marine mammals, marine turtles, seabirds and unknown species groups when brought alongside the boat as recorded by POP observers while deployed aboard U.S. commercial longline vessels, 1992-2002. Does not include animals whose status was unknown (<1% of all animals observed)

GROUP	COMMON NAME	ALIVE	DEAD	DAMAGED
TUNA OTHER	ALBACORE	1,085	3,247	237
	BLACKFIN TUNA	442	923	54
	BONITO	10	48	2
	LITTLE TUNY	71	255	4
	SKIPJACK TUNA	32	641	19
FINFISH	AMBERJACK SPP.	4	1	1
	BARRACUDA	170	36	3
	BLUEFISH	23	44	3
	COBIA	4	0	0
	CIGARFISH SPP.	74	90	3
	CUTLASS FISH	3	0	0
	DEALFISH	2	10	0
	DOLPHIN SPP.	11,641	3,272	234
	DRUM RED	7	0	0
	ESCOLAR	2,229	2,383	158
	YELLOW EDGE GROUPER	0	1	0
	GROUPER SPP.	0	2	0
	GOOSEFISH	2	0	0

	HALIBUT, ATLANTIC	0	1	0
	HADDOCK	1	1	0
	HAKE SPP	0	1	0
	HERRING	1	0	0
	JACK SPP.	3	2	0
	JACK CREVALE	1	0	0
	LANCETFISH SPP.	1,126	4,485	495
	MACKEREL ATLANTIC	1	2	0
	MACKEREL CHUB	0	8	0
	MACKEREL FRIGATE	2	2	0
	MACKEREL KING	8	27	3
	MAKERAL SNAKE	53	237	19
	OILFISH	524	339	25
	OPAH	21	19	0
	PUFFER SPP.	103	7	1
	POMFRET SPP.	178	159	5
	RAINBOW RUNNER	2	4	0
	REMORA	12	1	0
	SEA BASS BLACK	0	1	0
	SUNFISH SPP.	567	8	1
	SNAPPER BLACKFIN	0	1	0
	TARPON	1	0	0
	TRIGGERFISH	4	0	0
	TRIPLETAIL	2	1	0
	WAHOO	202	1,093	70
	WRECKFISH	2	0	0
	MISC FINFISH	224	120	4
MARINE MAMMAL	BEAKED WHALE	1	0	0
	PILOT WHALE SHORTFIN	3	0	0
	PILOT WHALE	81	4	0
	MARINE MAMMAL	4	0	0
	DOLPHIN RISSOS	41	5	0
	DOLPHIN PANTROPIC SPOTTED	2	0	0
	DOLPHIN BOTTLENOSE	4	0	0
	DOLPHIN	3	0	0
	COMMON DOLPHIN	3	0	0
	WHALE PYGMY SPERM	1	0	0
	WHALE KILLER	1	0	0
	WHALE	1	0	0
	WHALE NORTHERN BOTTLENOSE	1	0	0
	STRIPED DOLPHIN	1	0	0
MARINE TURTLE	KEMPS RIDLEY	2	0	0
	TURTLE GREEN	14	1	0

	TURTLE	20	0	0
	TURTLE LOGGERHEAD	682	4	0
	TURTLE LEATHERBACK	615	2	0
	TURTLE HAWKSBILL	3	0	0
SEA BIRD	GANNET NORTHERN	7	1	0
	GULL	8	9	0
	GULL BLACK BEAKED	1	3	0
	SHEARWATER GREATER	0	18	0
	SHEARWATER SPP.	1	2	0
	STORM PETREL	0	1	0
	SEABIRD	18	37	0
	GULL LAUGHING	1	0	0
	GULL HERRING	0	7	0
UNKOWN	BILLFISH	142	113	37
	SHARK	787	162	6
	TUNA	58	45	290
	UNKNOWN	1,636	53	39

Table 4. Discards of alive and dead fish of 6 species recorded by POP observers while deployed aboard U.S. commercial longline vessels, 1992-2002.

COMMON NAME	DISCARDED		PROPORTION DEAD $\frac{D}{D + A}$
	ALIVE (A)	DEAD (D)	
Swordfish	8,195	14,868	0.645
Bigeye Tuna	525	944	0.643
Yellowfin Tuna	1,053	2,205	0.677
Blue Marlin	845	636	0.429
White Marlin	1,205	1,234	0.506
Sailfish	645	1,100	0.630

Table 5. Average hook depth (minimum and maximum in fathoms) and kind of baits observed on U.S. commercial longline vessels by geographical area, 1992-2002. Baits used were: Atlantic mackerel (*Scomber scombrus*)=M, squid (*Illex sp.*)=Sq, herring (*Clupeidae sp.*)=H, Spanish sardine (*Sardinella aurita*)=Sa, bigeye scad (*Selar crumenophthalmus*)=Sc, and other =O (species not identified or artificial bait used). Bait type indicates sets fished using dead bait (stored frozen then thawed) and live bait (bait caught at sea and alive on hook).

Areas Fished	Total Hauls	Average		M	Bait Kind					Bait Type	
		Hook Depth			Sq	H	Sa	Sc	O	DEAD	LIVE
		(fathoms)									
		MIN	MAX								
CAR	205	31	42	26	179	0	0	0	0	205	0
GOM	1750	30	36	142	743	166	441	232	26	1405	345
FEC	589	23	32	190	389	2	2	0	6	589	0
SAB	615	18	26	151	458	1	0	0	5	615	0
MAB	896	13	19	139	677	27	0	0	53	896	0
NEC	443	12	18	31	389	11	0	0	12	443	0
NED	1291	9	11	210	1070	0	0	0	11	1291	0
SAR	14	33	42	1	13	0	0	0	0	14	0
NCA	266	36	40	22	236	0	0	0	8	266	0
TUN	33	35	37	0	33	0	0	0	0	33	0
TUS	35	31	33	0	35	0	0	0	0	35	0

Appendix 1.

(A) Longline gear characteristics log form.

OBS/TRIP NUMBER		VESSEL NAME		VESSEL NUMBER		DATE LANDED mm/dd/yyyy	
STRING NUMBER		NUMBER OF HOOKS		ANCHOR USED? NO _____ YES _____		WEIGHT _____ lbs	
MAINLINE COLOR _____ DIAMETER _____ mm Clear 01 _____ TEST _____ lbs White 02 _____ Pink 03 _____ Black 04 _____ MATERIAL _____ Green 05 _____ Nylon 1 _____ Blue 06 _____ Cotton 2 _____ Multi-color 07 _____ Steel Wire 3 _____ Red 08 _____ Other 9 _____ Other 09 _____ # OF STRANDS _____				FLOATS TYPE USED? NUMBER DISTANCE BETWEEN NO-0 YES=1 Polyball _____ Bullet/Daub _____ Other _____ MAX HOOKS BETWEEN _____ RADIO BEACONS _____ RADAR REFLECTORS _____ SECTIONS _____ mm		LIGHT STICKS USED? NO _____ YES _____ COLOR White 02 _____ Pink 03 _____ Black 04 _____ Green 05 _____ Blue 06 _____ Multi-color 07 _____ Red 08 _____ Other 09 _____ Yellow 10 _____ Purple 11 _____	
GANGIONS COLOR _____ DIAMETER _____ mm Clear 01 _____ TEST _____ lbs White 02 _____ Pink 03 _____ Black 04 _____ MATERIAL _____ Green 05 _____ Nylon 1 _____ Blue 06 _____ Cotton 2 _____ Multi-color 07 _____ Steel Wire 3 _____ Red 08 _____ Other 9 _____ Other 09 _____ DISTANCE BETWEEN _____ ft				GANGION LENGTH _____ GANGION COUNT _____ #1 _____ ft _____ #2 _____ ft _____ LEADER LENGTH _____ in LEADER TEST _____ lbs LEADER MATERIAL _____ Nylon 1 _____ Cotton 2 _____ Steel Wire 3 _____ Other 9 _____		LEADERS USED? NO-0, YES=1 SWIVELS USED? NO-0, YES=1 NUMBER SWIVELS/ GANGION _____	
DROPLINES LENGTH DISTANCE BETWEEN #1 _____ ft _____ ft #2 _____ ft _____ ft #3 _____ ft _____ ft		HOOKS BRAND MODEL/PATTERN SIZE HOOK #1 _____ / _____ HOOK #2 _____ / _____ HOOK #3 _____ / _____					
COMMENTS: NO _____ YES _____							

01/01/2003

(B) Longline haul log form

PELAGIC LONGLINE OBSERVER PROGRAM				LONGLINE HAUL LOG				SOUTHEAST FISHERIES SCIENCE CENTER			
OBS/TRIP ID	VESSEL NAME	VESSEL NUMBER	DATE LANDED	mm/dd/yyyy	HAUL #	GEAR CODE	PAGE# 1 OF				
HAUL OBS?	CATCH?	INC TAKE?	WEATHER	WIND		WAVE HEIGHT	REVERSE HAUL?	GEAR COND	STRING NUMBER		
NO 0	NO 0	NO 0		SPEED	DIRECTION		NO 0				
YES 1	YES 1	YES 1		KN	°	FT	YES 1				
MAINLINE LENGTH	SET SPEED	BOTTOM DEPTH RANGE	HOOK DEPTH RANGE	TOTAL ADD. WEIGHT		TARGET SPECIES ABBR.		SOAK DURATION			
NM	KN	FM	FM								
ITEMS USED?				NUMBER OF HOOKS		BAIT INFORMATION					
TYPE NO YES NUMBER Floats 0 1 Light Sticks 0 1 Rattlers 0 1 Surface Lights 0 1 Radio Beacons 0 1 Radar Reflectors 0 1 Additional Line Wts. 0 1				SET LOST TENDED REBAITED		NUMBER LBS KIND TYPE COND #1 #2 #3					
SET/HAUL INFO	DATE	TIME	POSITION INFORMATION				TEMP	DURATION			
	mm/dd/yyyy	24 hours	BEARING/LATITUDE	N OR S	BEARING/LONGITUDE	E OR W	fahrenheit	hours			
S BEGIN											
E											
T END											
H BEGIN											
A											
U END											
L											
COMMENTS: NO 0 YES 1											

1/1/2002

(C) Large pelagics individual animal log form.

**SOUTHEAST FISHERIES SCIENCE CENTER
INDIVIDUAL ANIMAL LOG**

01-01-2000

[illegible]